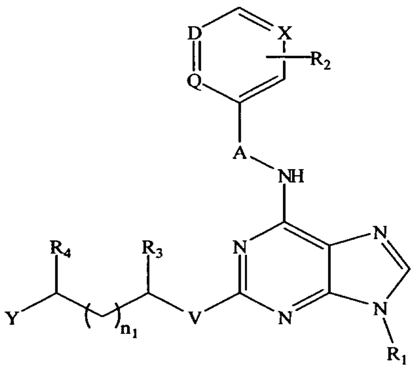
Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (original) A compound of the following formula:



Formula I

wherein:

R_1 are the same or different and independently selected from the group consisting of:
- H;
- C_1-C_6-straight chain alkyl;
- C_2-C_6-straight alkenyl chain;
- C_3-C_6-branched alkyl chain;
- C_3-C_6-branched alkenyl chain;
- C_3-C_7-cycloalkyl;
- CH_2-(C_3-C_7-cycloalkyl);
- CH_2CF_3;
- $CH_2CH_2CF_3$; and
- $CH(CF_3)_2$;

Q=N and D=X=CH;

V=
- NH;
- O;
- S; or
- CH_2;

R_2=
- phenyl;
- substituted phenyl, wherein the substituents (1-2 in number) are in any position and are independently selected from the group consisting of R_1, OR_1, SR_1, $S(O)R_1$, $S(O_2)R_1$, NHR_1, NO_2, $OC(O)CH_3$, $NHC(O)CH_3$, F, Cl, Br, CF_3, $C(O)R_1$, $C(O)NHR_1$, phenyl, and $C(O)NHCHR_1CH_2OH$;

1-naphthyl;
2-naphthyl;
heterocycles selected from the group consisting of:
    2-pyridyl;
    3-pyridyl;
    4-pyridyl;
    2-pyrimidyl;
    4-pyrimidyl;
    5-pyrimidyl;
    thiophene-2-yl;
    thiophene-3-yl;
    2-furanyl;
    3-furanyl;
    oxazol-2-yl;
    oxazol-4-yl;
    oxazol-5-yl;
    thiazol-2-yl;
    thiazol-4-yl;
    thiazol-5-yl;
    imidazol-2-yl;
    imidazol-4-yl;
    pyrazol-3-yl;
    pyrazol-4-yl;
    isoxazol-3-yl;
    isoxazol-4-yl;
    isoxazol-5-yl;
    isothiazol-3-yl;
    isothiazol-4-yl;
    isothiazol-5-yl;
    1,3,4-thiadiazol-2-yl;
    benzo[b]furan-2-yl;
    benzo[b]thiophene-2-yl;
    2-pyrrolyl;
    3-pyrrolyl;
    1,3,5-triazin-2-yl;
    pyrazin-2-yl;
    pyridazin-3-yl;
    pyridazin-4-yl;
    2-quinolinyl;
    3-quinolinyl;
    4-quinolinyl;
    1-isoquinolinyl;
    3-isoquinolinyl; and
    4-isoquinolinyl; or
substituted heterocycle, wherein the substituents (1-2 in number) are in any position and are independently selected from the group consisting of Br, Cl, F, R_1, and $C(O)CH_3$;

R_3 are the same or different and independently selected from the group consisting of:
H;
C_1-C_4-straight chain alkyl;
C_3-C_4-branched chain alkyl;
C_2-C_4-alkenyl chain;
$(CH_2)_nPh$; and
$(CH_2)_n$-substituted phenyl, wherein the phenyl substituents are as defined above in R_2;

R_4= H;
C_1-C_4-straight chain alkyl; or
C_3-C_4-branched chain alkyl;

R_3 and R_4 can be linked together by a carbon chain to form with intervening atoms a 5-8-membered saturated or unsaturated ring;

n_1= 0-3;

n= 0-3;

A= CH_2;
$(CH_2)_2$;
$(CH_2)_3$;
OCH_2CH_2; or
$CHCH_3$;

Y= H;
OR_1;
$N(R_1)_2$;
$N(R_1)C(O)R_3$;
$N(R_1)C(O)R_5$;
$N(R_1)C(O)CH(R_6)NH_2$;
$N(R_1)SO_2R_3$;
$N(R_1)C(O)NHR_3$; or
$N(R_1)C(O)OR_6$;

R_5= C_3-C_7-cycloalkyl;

R_6= C_1-C_4-straight chain alkyl;
C_3-C_4-branched chain alkyl;
C_2-C_4-alkenyl chain;
$(CH_2)_nPh$; or
$(CH_2)_n$-substituted phenyl, wherein the phenyl substituents are as defined above in R_2;

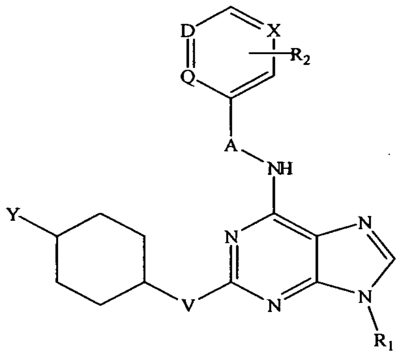
or a pharmaceutically acceptable salt thereof.

2. (original) A compound according to claim 1, wherein

R_3 are the same or different and independently selected from the group consisting of:
H;
C_1-C_4-straight chain alkyl; and
C_3-C_4-branched chain alkyl;

Y= H;
OR_1;
$N(R_1)_2$;
$N(R_1)C(O)R_3$;
$N(R_1)SO_2R_3$; or
$N(R_1)C(O)NHR_3$.

3. (original) A compound of the following formula:



Formula III

wherein:

R_1 are the same or different and independently selected from the group consisting of:
H;
C_1-C_6-straight chain alkyl;
C_2-C_6-straight alkenyl chain;
C_3-C_6-branched alkyl chain;
C_3-C_6-branched alkenyl chain;
C_3-C_7-cycloalkyl;
CH_2-(C_3-C_7-cycloalkyl);
CH_2CF_3;
$CH_2CH_2CF_3$; and
$CH(CF_3)_2$;

Q=N and D=X=CH;

V= NH;

O;
S; or
CH_2;

R_2= phenyl;
substituted phenyl, wherein the substituents (1-2 in number) are in any position and are independently selected from the group consisting of R_1, OR_1, SR_1, $S(O)R_1$, $S(O_2)R_1$, NHR_1, NO_2, $OC(O)CH_3$, $NHC(O)CH_3$, F, Cl, Br, CF_3, $C(O)R_1$, $C(O)NHR_1$, phenyl, and $C(O)NHCHR_1CH_2OH$;
1-naphthyl;
2-naphthyl;
heterocycles selected from the group consisting of:
  2-pyridyl;
  3-pyridyl;
  4-pyridyl;
  2-pyrimidyl;
  4-pyrimidyl;
  5-pyrimidyl;
  thiophene-2-yl;
  thiophene-3-yl;
  2-furanyl;
  3-furanyl;
  oxazol-2-yl;
  oxazol-4-yl;
  oxazol-5-yl;
  thiazol-2-yl;
  thiazol-4-yl;
  thiazol-5-yl;
  imidazol-2-yl;
  imidazol-4-yl;
  pyrazol-3-yl;
  pyrazol-4-yl;
  isoxazol-3-yl;
  isoxazol-4-yl;
  isoxazol-5-yl;
  isothiazol-3-yl;
  isothiazol-4-yl;
  isothiazol-5-yl;
  1,3,4-thiadiazol-2-yl;
  benzo[b]furan-2-yl;
  benzo[b]thiophene-2-yl;
  2-pyrrolyl;
  3-pyrrolyl;
  1,3,5-triazin-2-yl;
  pyrazin-2-yl;
  pyridazin-3-yl;
  pyridazin-4-yl;
  2-quinolinyl;

3-quinolinyl;
4-quinolinyl;
1-isoquinolinyl;
3-isoquinolinyl; and
4-isoquinolinyl; or

substituted heterocycle, wherein the substituents (1-2 in number) are in any position and are independently selected from the group consisting of Br, Cl, F, R_1, and $C(O)CH_3$;

n= 0-3;

A= CH_2;
$(CH_2)_2$;
$(CH_2)_3$;
OCH_2CH_2; or
$CHCH_3$;

Y= H;
OR_1;
$N(R_1)_2$;
$N(R_1)C(O)R_3$;
$N(R_1)C(O)R_5$;
$N(R_1)C(O)CH(R_6)NH_2$;
$N(R_1)SO_2R_3$;
$N(R_1)C(O)NHR_3$; or
$N(R_1)C(O)OR_6$;

R_3 are the same or different and independently selected from the group consisting of:
H;
C_1-C_4-straight chain alkyl;
C_3-C_4-branched chain alkyl;
C_2-C_4-alkenyl chain;
$(CH_2)_nPh$; and
$(CH_2)_n$-substituted phenyl, wherein the phenyl substituents are as defined above in R_2;

R_5= C_3-C_7-cycloalkyl;

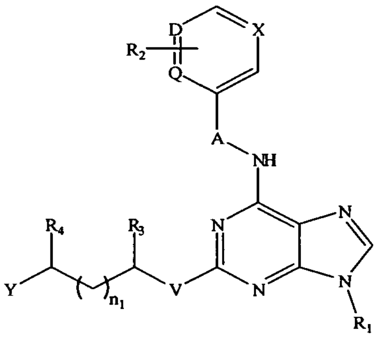
R_6 = C_1-C_4-straight chain alkyl;
C_3-C_4-branched chain alkyl; or
C_2-C_4-alkenyl chain;

or a pharmaceutically acceptable salt thereof.

4. (original) A pharmaceutical composition of matter comprising the compound of claim 1 and one or more pharmaceutical excipients.

5. (original) A pharmaceutical composition of matter comprising the compound of claim 3 and one or more pharmaceutical excipients.

6. (original) A process for preparation of a purine derivative compound of the formula:



Formula I

wherein:

R_1 are the same or different and independently selected from the group consisting of:

H;
C_1-C_6-straight chain alkyl;
C_2-C_6-straight alkenyl chain;
C_3-C_6-branched alkyl chain;
C_3-C_6-branched alkenyl chain;
C_3-C_7-cycloalkyl;
CH_2-(C_3-C_7-cycloalkyl);
CH_2CF_3;
$CH_2CH_2CF_3$; and
$CH(CF_3)_2$;

Q=N and D=X=CH;

V= NH;
O;
S; or
CH_2;

R_2= phenyl;
substituted phenyl, wherein the substituents (1-2 in number) are in any position and are independently selected from the group consisting of R_1, OR_1, SR_1, $S(O)R_1$, $S(O_2)R_1$, NHR_1, NO_2, $OC(O)CH_3$, $NHC(O)CH_3$, F, Cl, Br, CF_3, $C(O)R_1$, $C(O)NHR_1$, phenyl, and $C(O)NHCHR_1CH_2OH$;
1-naphthyl;
2-naphthyl;
heterocycles selected from the group consisting of:

2-pyridyl;
3-pyridyl;
4-pyridyl;
2-pyrimidyl;
4-pyrimidyl;
5-pyrimidyl;
thiophene-2-yl;
thiophene-3-yl;
2-furanyl;
3-furanyl;
oxazol-2-yl;
oxazol-4-yl;
oxazol-5-yl;
thiazol-2-yl;
thiazol-4-yl;
thiazol-5-yl;
imidazol-2-yl;
imidazol-4-yl;
pyrazol-3-yl;
pyrazol-4-yl;
isoxazol-3-yl;
isoxazol-4-yl;
isoxazol-5-yl;
isothiazol-3-yl;
isothiazol-4-yl;
isothiazol-5-yl;
1,3,4-thiadiazol-2-yl;
benzo[b]furan-2-yl;
benzo[b]thiophene-2-yl;
2-pyrrolyl;
3-pyrrolyl;
1,3,5-triazin-2-yl;
pyrazin-2-yl;
pyridazin-3-yl;
pyridazin-4-yl;
2-quinolinyl;
3-quinolinyl;
4-quinolinyl;
1-isoquinolinyl;
3-isoquinolinyl; and
4-isoquinolinyl; or

substituted heterocycle, wherein the substituents (1-2 in number) are in any position and are independently selected from the group consisting of Br, Cl, F, R_1, and $C(O)CH_3$;

R_3 are the same or different and independently selected from the group consisting of:

H;
C_1-C_4-straight chain alkyl;

C_3-C_4-branched chain alkyl;
C_2-C_4-alkenyl chain;
$(CH_2)_nPh$; and
$(CH_2)_n$-substituted phenyl, wherein the phenyl substituents are as defined above in R_2;

R_4= H;
C_1-C_4-straight chain alkyl; or
C_3-C_4-branched chain alkyl;

R_3 and R_4 can be linked together by a carbon chain to form with intervening atoms a 5-8-membered saturated or unsaturated ring;

n_1= 0-3;

n= 0-3;

A= CH_2;
$(CH_2)_2$;
$(CH_2)_3$;
OCH_2CH_2; or
$CHCH_3$;

Y= H;
OR_1;
$N(R_1)_2$;
$N(R_1)C(O)R_3$;
$N(R_1)C(O)R_5$;
$N(R_1)C(O)CH(R_6)NH_2$;
$N(R_1)SO_2R_3$;
$N(R_1)C(O)NHR_3$; or
$N(R_1)C(O)OR_6$;

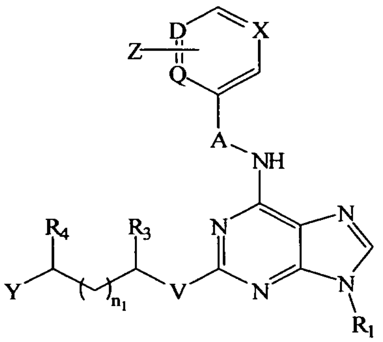
R_5= C_3-C_7-cycloalkyl;

R_6= C_1-C_4-straight chain alkyl;
C_3-C_4-branched chain alkyl;
C_2-C_4-alkenyl chain;
$(CH_2)_nPh$; or
$(CH_2)_n$-substituted phenyl, wherein the phenyl substituents are as defined above in R_2;

or a pharmaceutically acceptable salt thereof;

said process comprising:

reacting a first intermediate compound of the formula:



Formula IX

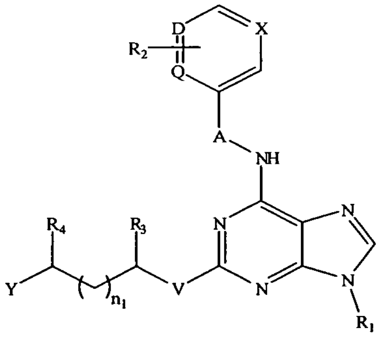
where Z= Br or I

with a compound of the formula: R_2-B(OH)$_2$, R_2-Sn(n-Bu)$_3$,or R_2-Sn(Me)$_3$, or mixtures thereof, under conditions effective to form the purine derivative compound.

7. (original) A process according to claim 6, wherein if Y is NHR_1, said process further comprises:

reacting the purine derivative compound with $R_3C(O)Cl$ or $R_5C(O)Cl$ or R_3SO_2Cl or R_3NCO or $R_6OC(O)Cl$ under conditions effective to form a final product having the same formula as the purine derivative compound except that Y is $NR_1C(O)R_3$ or $NR_1C(O)R_5$ or $NR_1SO_2R_3$ or $NR_1C(O)NHR_3$ or $NR_1C(O)OR_6$.

8. (original) A process for preparation of a purine derivative compound of the formula:



Formula I

wherein:

R_1 are the same or different and independently selected from the group consisting of:

H;

C_1-C_6-straight chain alkyl;
C_2-C_6-straight alkenyl chain;
C_3-C_6-branched alkyl chain;
C_3-C_6-branched alkenyl chain;
C_3-C_7-cycloalkyl;
CH_2-(C_3-C_7-cycloalkyl);
CH_2CF_3;
$CH_2CH_2CF_3$; and
$CH(CF_3)_2$;

Q=N, and D=X=CH;

V= NH;
O; or
S;

R_2= phenyl;
substituted phenyl, wherein the substituents (1-2 in number) are in any position and are independently selected from the group consisting of R_1, OR_1, SR_1, $S(O)R_1$, $S(O_2)R_1$, NHR_1, NO_2, $OC(O)CH_3$, $NHC(O)CH_3$, F, Cl, Br, CF_3, $C(O)R_1$, $C(O)NHR_1$, phenyl, and $C(O)NHCHR_1CH_2OH$;
1-naphthyl;
2-naphthyl;
heterocycles selected from the group consisting of:
    2-pyridyl;
    3-pyridyl;
    4-pyridyl;
    2-pyrimidyl;
    4-pyrimidyl;
    5-pyrimidyl;
    thiophene-2-yl;
    thiophene-3-yl;
    2-furanyl;
    3-furanyl;
    oxazol-2-yl;
    oxazol-4-yl;
    oxazol-5-yl;
    thiazol-2-yl;
    thiazol-4-yl;
    thiazol-5-yl;
    imidazol-2-yl;
    imidazol-4-yl;
    pyrazol-3-yl;
    pyrazol-4-yl;
    isoxazol-3-yl;
    isoxazol-4-yl;
    isoxazol-5-yl;
    isothiazol-3-yl;

isothiazol-4-yl;
isothiazol-5-yl;
1,3,4-thiadiazol-2-yl;
benzo[b]furan-2-yl;
benzo[b]thiophene-2-yl;
2-pyrrolyl;
3-pyrrolyl;
1,3,5-triazin-2-yl;
pyrazin-2-yl;
pyridazin-3-yl;
pyridazin-4-yl;
2-quinolinyl;
3-quinolinyl;
4-quinolinyl;
1-isoquinolinyl;
3-isoquinolinyl; and
4-isoquinolinyl; or

substituted heterocycle, wherein the substituents (1-2 in number) are in any position and are independently selected from the group consisting of Br, Cl, F, R_1, and $C(O)CH_3$;

R_3 are the same or different and independently selected from the group consisting of:
H;
C_1-C_4-straight chain alkyl;
C_3-C_4-branched chain alkyl;
C_2-C_4-alkenyl chain;
$(CH_2)_nPh$; and
$(CH_2)_n$-substituted phenyl, wherein the phenyl substituents are as defined above in R_2;

R_4= H;
C_1-C_4-straight chain alkyl; or
C_3-C_4-branched chain alkyl;

R_3 and R_4 can be linked together by a carbon chain to form with intervening atoms a 5-8-membered saturated or unsaturated ring;

n_1= 0-3;

n= 0-3;

A= CH_2;
$(CH_2)_2$;
$(CH_2)_3$;
OCH_2CH_2; or
$CHCH_3$;

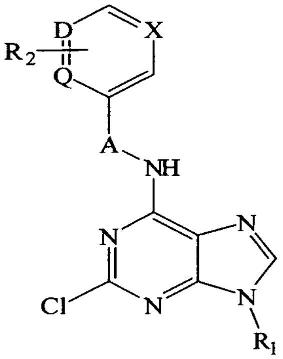
Y= H;
OR_1;

$N(R_1)_2$;
$N(R_1)C(O)R_3$;
$N(R_1)C(O)R_5$;
$N(R_1)C(O)CH(R_6)NH_2$;
$N(R_1)SO_2R_3$;
$N(R_1)C(O)NHR_3$; or
$N(R_1)C(O)OR_6$;

R_5= C_3-C_7-cycloalkyl;

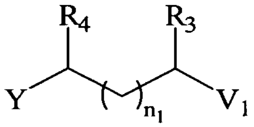
R_6= C_1-C_4-straight chain alkyl;
C_3-C_4-branched chain alkyl;
C_2-C_4-alkenyl chain;
$(CH_2)_nPh$; or
$(CH_2)_n$-substituted phenyl, wherein the phenyl substituents are as defined above in R_2;
or a pharmaceutically acceptable salt thereof; said process comprising:

reacting a first intermediate compound of the formula:



Formula XIV

with a compound of the formula:



Formula VIII

where V_1= NH_2;
OH; or
SH;

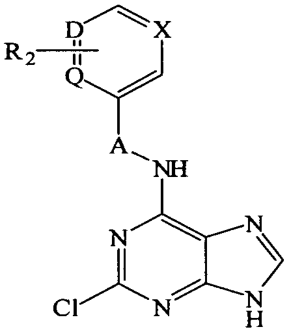
under conditions effective to form the purine derivative compound.

9. (original) A process according to claim 8, wherein if Y is NHR_1, said process further comprises:

reacting the purine derivative compound with $R_3C(O)Cl$ or $R_5C(O)Cl$ or R_3SO_2Cl or R_3NCO or $R_6OC(O)Cl$ under conditions effective to form a final product having the same formula as the purine derivative compound except that Y is $NR_1C(O)R_3$ or $NR_1C(O)R_5$ or $NR_1SO_2R_3$ or $NR_1C(O)NHR_3$ or $NR_1C(O)OR_6$.

10. (original) A process according to claim 8 further comprising:

reacting a second intermediate compound of the formula:

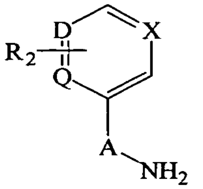


Formula XVIII

with a compound of the formula R_1-Z under conditions effective to form the first intermediate compound.

11. (original) A process according to claim 10 further comprising:

reacting a third intermediate compound of the formula:

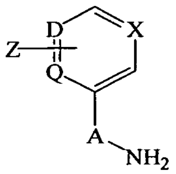


Formula XVII

with a compound of the formula 2,6-dichloropurine under conditions effective to form the second intermediate compound.

12. (original) A process according to claim 11 further comprising:

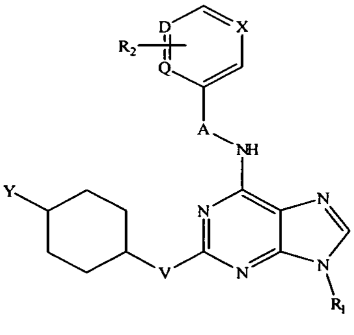
reacting a fourth intermediate compound of the formula:



Formula V

with a compound of the formula: R_2-B(OH)$_2$, R_2-Sn(n-Bu)$_3$, or R_2-Sn(Me)$_3$, or mixtures thereof, under conditions effective to form the third intermediate compound.

13. (currently amended) A process according to claim 8, wherein the purine derivative compound has the formula:



Formula III.